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1	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.		X	MP.7	Extend the properties of exponents to rational exponents.			M		M		
2	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.		X	MP.7	Perform arithmetic operations with complex numbers.			A		A		x (m2 only)
3	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.		N	MP.6, MP.7	Perform arithmetic operations with complex numbers.			A		A		x (m2 only)
4	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.	i) Tasks are limited to equations with non-real solutions.	X	MP.5	Use complex numbers in polynomial identities and equations.			A		A		x (m2 only)
5	A-APR.1-1	Add, subtract, and multiply polynomials.	i) The "understand" part of the standard is not assessed here; it is assessed under Sub-Claim C	Z		Perform arithmetic operations on polynomials	M				M		
6	A-APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.		N	MP.6	Understand the relationship between zeros and factors of polynomials			M			M	x
79	A-APR.3-1	Identify zeros of quadratic and cubic polynomials in which linear and quadratic factors are available, and use the zeros to construct a rough graph of the polynomial.	i) For example, find the zeros of $(x-2)(x^2-9)$.	N	MP.7	Understand the relationship between zeros and factors of polynomials	S					M	
7	A-APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system	i) Examples will be simple enough to allow inspection or long division.	Z	MP.1	Rewrite rational expressions			S			A	x
8	A-CED.4-1	Rearrange linear formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*	i) Tasks have a context.	Z	MP.2, MP.6, MP.7	Create equations that describe numbers or relationships	M			M			
9	A-CED.4-2	Rearrange formulas that are quadratic in the quantity of interest to highlight the quantity of interest, using the same reasoning as in solving equations.	i) Tasks have a context.	Z	MP.2, MP.6, MP.7	Create equations that describe numbers or relationships	M				M		x
10	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		X	MP.7	Represent and solve equations and inequalities graphically	M			M			
11	A-REI.11-1a	Find the solutions of where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect, e.g. using technology to graph the functions, make tables of values or find successive approximations. Limit $f(x)$ and/or $g(x)$ to linear and quadratic functions.★	~~iii~~) The "explain" part of standard A-REI.11 is not assessed here. For this aspect of the standard, see subclaim C.	X	MP.1, MP.5	Represent and solve equations and inequalities graphically	M			M			

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11	A-REI.11-1b	Find the solutions of where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect, e.g. using technology to graph the functions, make tables of values or find successive approximations. Limit $f(x)$ and/or $g(x)$ to polynomial functions.★	iii) The "explain" part of standard A-REI.11 is not assessed here. For this aspect of the standard, see subclaim C. ii) Polynomials are of degree two and higher.	Y	MP.1, MP.5	Represent and solve equations and inequalities graphically	M			M			x
12	A-REI.11-2	Find the solutions of where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect, e.g.using technology to graph the functions, make tables of values or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and/or logarithmic functions.★	i) The "explain" part of standard A-REI.11 is not assessed here. For this aspect of the standard, see subclaim C.	X	MP.1, MP.5	Represent and solve equations and inequalities graphically			M			M	
13	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.		N	MP.1, MP.5, MP.6	Represent and solve equations and inequalities graphically	M			M			
14	A-REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.		N	MP.3, MP.6	Understand solving equations as a process of reasoning and explain the reasoning			M			M	
80	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.			MP.7	Solve equations and inequalities in one variable	M			M			
15	A-REI.4a-1	Solve quadratic equations in one variable. a) Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions.	i) The derivation part of the standard is not assessed here; it is assessed under Sub-Claim C.	X	MP.1, MP.7	Solve equations and inequalities in one variable	M				M		
16	A-REI.4b-1	Solve quadratic equations in one variable. b) Solve quadratic equations with rational number coefficients by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation.	i) Tasks should exhibit variety in initial forms. Examples of quadratic equations with real solutions: t ^2 = 49, 3a ^2 = 4, 7 = x ^2, r ^2 = 0, (1/2) y ^2 = 1/5, y ^2 - 8y + 15 = 0, 2x ^2 - 16x + 30 = 0, 2p = p ^2 + 1, t ^2 = 4t , 7x ^2 + 5x - 3 = 0, (3/4)c (c - 1) = c, (3x - 2)^2 = 6x - 4 ii) Methods are not explicitly assessed; strategy is assessed indirectly by presenting students with a variety of initial forms. iii) For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. iv) Prompts integrate mathematical practices by not indicating that the equation is quadratic. (E.g., "Find all real solutions of the equation t ^2 = 4t " ... not, "Solve the quadratic equation t ^2 = 4t .")	X	MP.7, MP.5	Solve equations and inequalities in one variable	M				M		
18	A-REI.4b	Solve quadratic equations in one variable. b) Recognize when the quadratic formula gives complex solutions.	i) Tasks involve recognizing an equation with complex solutions, e.g., "Which of the following equations has no real solutions?" with one of the options being a quadratic equation with non-real solutions. ii) Writing solutions in the form a ± bi is not assessed here.(N-CN.7.)	Z	MP.7, MP.5	Solve equations and inequalities in one variable	M		S		M		
87	A-REI.6-2	Solve algebraically a system of three linear equations in three unknowns.	i) 80% of systems have a unique solution. 20% of systems have no solution or infinitely many solutions. ii) Coefficients are rational numbers. iii) Tasks do not require any specific method to be used (e.g., prompts do not direct the student to use elimination or any other particular method).		MP.1, MP.7	Solve systems of equations			A	A			
85	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = -3x and the circle x^2 + y^2 = 3.	i) Tasks have thin context or no context.		MP.1	Solve systems of equations			A		A		
19	A-SSE.1-1	Interpret exponential expressions, including related numerical expressions that represent a quantity in terms of its context.★ a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	i) See illustrations for A-SSE.1 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/390	Z	MP.7	Interpret the structure of expressions	M			M			x (A1 only)

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20	A-SSE.1-2	Interpret quadratic expressions that represent a quantity in terms of its context.★ a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity.	i) See illustrations for A-SSE.1 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/90	Z	MP.7	Interpret the structure of expressions	M				M		
21	A-SSE.2-1	Use the structure of numerical expressions and polynomial expressions in one variable to identify ways to rewrite it.	i) Examples: Recognize $53^2 - 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier-to- evaluate form (53 + 47)(53 - 47). See an opportunity to rewrite $a^2 + 9a + 14$ as (a + 7)(a + 2).	Z	MP.7	Interpret the structure of expressions	M						
22	A-SSE.2-2	Use the structure of quadratic or exponential expressions, including related numerical expressions to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*	i) Examples: Recognize $53^2 - 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier-to- evaluate form (53 + 47)(53 - 47). See an opportunity to rewrite $a^2 + 9a + 14$ as (a + 7)(a + 2).	Z	MP.7	Interpret the structure of expressions					M		x
23	A-SSE.2-3	Use the structure of polynomial, rational or exponential expressions to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*	i) Additional examples: -In the equation $x^2 + 2x + 1 + y^2 = 9$, see an opportunity to rewrite the first three terms as $(x+1)^2$, thus recognizing the equation of a circle with radius 3 and center (-1, 0). See $(x^2 + 4)/(x^2 + 3)$ as $(x^2+3) + 1)/(x^2+3)$, thus recognizing an opportunity to write it as $1 + 1/(x^2 + 3)$.	Z	MP.7	Interpret the structure of expressions				M		M	
24	A-SSE.3a	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines.		Z	MP.7	Write expressions in equivalent forms to solve problems	S				M		
25	A-SSE.3b	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.		Z	MP.7	Write expressions in equivalent forms to solve problems	S				M		x
26	A-SSE.3c-1	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression, where exponentials are limited to integer exponents. ★ c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	i) Tasks have a context. As described in the standard, there is an interplay between the mathematical structure of the expression and the structure of the situation such that choosing and producing an equivalent form of the expression reveals something about the situation.	Z	MP.1, MP.2, MP.4, MP.7	Write expressions in equivalent forms to solve problems	S				M		x(A1 only)
27	A-SSE.3c-2	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression, where exponentials are limited to rational or real exponents.★ c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	i) Tasks have a context. As described in the standard, there is an interplay between the mathematical structure of the expression and the structure of the situation such that choosing and producing an equivalent form of the expression reveals something about the situation.	Z	MP.1, MP.2, MP.4, MP.7	Write expressions in equivalent forms to solve problems			M		M		x (m2 only)
28	A.Int.1	Solve equations that require seeing structure in expressions.	i) Tasks do not have a context. ii) Equations simplify considerably after appropriate algebraic manipulations are performed. For example, if 24 + 10*x* - *x*^2 = *p* - (*x* - 5)^2 then find the value of *p;* solve (3*x* - 2)^2 = 6*x* - 4.	N	MP.7, MP.1				M			M	
83	F-BF.1b-1	Represent arithmetic combinations of standard function types algebraically.	i) Tasks may or may not have a context. Ii) For example, given f(x) = e^(x) and g(x) = 5, write an expression for h(x) = 2f(-3x) + g(x). iii) More substantial work along these lines occurs in SubClaim D.			Build a function that models a relationship between two quantities.			M		S		
84	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	i) Tasks do not have a context. Ii) More substantial work along these lines occurs in SubClaim D.			Build a function that models a relationship between two quantities.			M	M			

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29	F-BF.3-1	Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x) , f(kx)* , and *f(x + k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs limiting the function types to linear and quadratic functions.	i) Tasks do not involve recognizing even and odd functions. ii) Experimenting with cases and illustrating an explanation are not assessed here.	X	MP.3, MP.5, MP.7	Build new functions from existing functions	A				A		x
30	F-BF.3-2	Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x) , f(kx)* , and *f(x + k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs, limiting the function types to polynomial, exponential, logarithmic, and trigonometric functions.	i) Experimenting with cases and illustrating an explanation are not assessed here.	X	MP.5, MP.7	Build new functions from existing functions			A			A	x
31	F-BF.3-3	Recognize even and odd functions from their graphs and algebraic expressions for them, limiting the function types to polynomial, exponential, logarithmic, and trigonometric functions.	i) Experimenting with cases and illustrating an explanation are not assessed here.	Z	MP.7	Build new functions from existing functions			A			A	x
32	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f(x)* denotes the output of f corresponding to the input *x* . The graph of *f* is the graph of the equation *y = f(x)* .		Z	MP.2	Understand the concept of a function and use function notation	M			M			
33	F-IF.A.Int.1	Understand the concept of a function and use funciton notation	i) Tasks require students to use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context ii) About a quarter of tasks involve functions defined recursively on a domain in the integers	X	MP.2	Understand the concept of a function and use function notation	M			M			x (A1 only)
81	F-IF.5-1	Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes, limiting to linear functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute-value functions) , and exponential functions with domains in the integers. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for this function.*	i) Tasks have a real-world context.		MP.2	Interpret functions that arise in applications in terms of the context	M			M			
82	F-IF.5-2	Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes, limiting to quadratic functions. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for this function.*	i) Tasks have a real-world context.		MP.2	Interpret functions that arise in applications in terms of the context	M				M		
34	F-IF.6-1a	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear and quadratic functions.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context	M						
34	F-IF.6-1b	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear, quadratic, square root, cube root, piecewise-defined (including step and absolute value functions) and exponential functions with domains in the integers.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context	M						x
35	F-IF.6-2	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to polynomial, exponential, logarithmic and trigonometric functions.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context			M				x

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36	F-IF.6-3a	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear functions.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context				M			
36	F-IF.6-3b	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear, square root, cube root, piecewise-defined (including step and absolute value functions) and exponential functions with domains in the integers.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context				M			x
37	F-IF.6-4	Calculate and interpret the average rate of change of a quadratic or exponential function (presented symbolically or as a table) over a specified interval. ★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context					M		x
38	F-IF.6-5	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.★	i) Tasks have a context. ii) Tasks may involve polynomial, logarithmic, and trigonometric functions.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context						M	
39	F-IF.6-6a	Estimate the rate of change from a graph utilizing linear functions and quadratic functions.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context	M						
39	F-IF.6-6b	Estimate the rate of change from a graph utilizing linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and/or exponential functions with domains in the integers.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context	M						x
40	F-IF.6-7	Estimate the rate of change from a graph.★	i) Tasks have a context. ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context			M				x
41	F-IF.6-8	Estimate the rate of change from a graph utilizing linear functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and/or exponential functions with domains in the integers.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context				M			
42	F-IF.6-9	Estimate the rate of change from a graph utilizing quadratric and/or exponential functions.★	i) Tasks have a context.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context					M		x
43	F-IF.6-10	Estimate the rate of change from a graph.★	i) Tasks have a context. ii) Tasks may involve polynomial, logarithmic, and trigonometric functions.	X	MP.1, MP.4, MP.5, MP.7	Interpret functions that arise in applications in terms of the context						M	
44	F-IF.7a-1	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ a) Graph linear functions and show intercepts, maxima, and minima.		X	MP.1, MP.5, MP.6	Analyze functions using different representations	S			S			
45	F-IF.7a-2	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ a) Graph quadratic functions and show intercepts, maxima, and minima.		X	MP.1, MP.5, MP.6	Analyze functions using different representations	S				S		
46	F-IF.7b	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. b) Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.		X	MP.1, MP.5, MP.6	Analyze functions using different representations	S				S		x

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47	F-IF.7c	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. c) Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.		X	MP.1, MP.5, MP.6	Analyze functions using different representations			S			S	x
48	F-IF.7e-1	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. e) Graph exponential functions, showing intercepts and end behavior.		X	MP.1, MP.5, MP.6	Analyze functions using different representations			S		S		x (a2 only)
49	F-IF.7e-2	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. e) Graph logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	i) About half of tasks involve logarithmic functions, while the other half involve trigonometric functions.	X	MP.1, MP.5, MP.6	Analyze functions using different representations			S			S	x
50	F-IF.8b	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. b) Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as* $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, *and classify them as representing exponential growth or decay.*		Z	MP.7	Analyze functions using different representations			S		S		x (a2 only)
51	F-IF.9-1	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* Function types should be limited to imited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.	i) Tasks may or may not have a-context.	X	MP.1, MP.3, MP.5, MP.6, MP.8	Analyze functions using different representations	S						x
52	F-IF.9-2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).*Function types are limited to polynomial, exponential, logarithmic, and trigonometric functions.*	i) Tasks may or may not have a context.	X	MP.1, MP.3, MP.5, MP.6, MP.8	Analyze functions using different representations			S				x
53	F-IF.9-3	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* Function types are limited to linear functions, square root functions, cube root functions, piecewise- defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.	i) Tasks may or may not have a-context.	X	MP.1, MP.2, MP.3, MP.5, MP.6, MP.8	Analyze functions using different representations				S			
54	F-IF.9-4	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* Function types are limited quadratic and exponential functions.	i) Tasks may or may not not have a context.	X	MP.1, MP.3, MP.5, MP.6, MP.8	Analyze functions using different representations					S		x
55	F-IF.9-5	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *Function types are limited to polynomial, logarithmic and trigonometric functions.*	i) Tasks may or may not have a context.	X	MP.1, MP.2, MP.3, MP.5, MP.6, MP.8	Analyze functions using different representations						S	
56	F-LE.2-1	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	i) Tasks are limited to contructing linear and exponential functions with domains in the integers, in simple context (not multi-step).	X	MP.1, MP.2, MP.5	Construct and compare linear, quadratic, and exponential models and solve problems	S			S			x (A1 only)

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57	F-TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.		X	MP.6	Extend the domain of trigonometric functions using the unit circle			A			A	x
58	F-TF.8-2	Use the Pythagorean identity sin2(θ) + cos2(θ) = 1 . to find sin q, cos q , or tan q, given sin q, cos q, or tan q, and the quadrant of the angle.	i) The "prove" part of standard F-TF.8 is not assessed here. See Subclaim C for this aspect of the standard.	X	MP.5, MP.7	Prove and apply trigonometric identities			A			A	x (A2 only)
77	G-C.B.Int.1	Find arc lengths and areas of sectors of circles.	i) Tasks involve computing arc lengths or areas of sectors given the radius and the angle subtended; or vice versa.	X		Find arc lengths and areas of sectors of circles.		A				A	x
59	G-C.2A.Int.1	Identify and describe relationships among inscribed angles, radii, and chords and apply these concepts in problem solving situations.		X	MP.1, MP.5	Understand and apply theorems about circles		A				A	x
60	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.		Z	MP.6	Experiment with transformations in the plane		S		S			x (m1 only)
61	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.		Z	MP.5, MP.6, MP.7	Experiment with transformations in the plane		S		S			x (m1 only)
62	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.		X	MP.5, MP.6, MP.7	Experiment with transformations in the plane		S		S			x (m1 only)
75	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.		Z		Understand congruence in terms of rigid motions		M		M			x
88	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*			MP.3, MP.6, MP.7	Explain volume formulas and use them to solve problems							
78	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★		X	MP. 4	Explain volume formulas and use them to solve problems		A			A		x
63	G-GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.		Z	MP.7	Visualize relationships between two-dimensional and three-dimensional objects		A				A	x
64	G-GPE.1-2	Complete the square to find the center and radius of a circle given by an equation.	i) The "derive" part of standard G-GPE.1 is not assessed here. See Subclaim C for this aspect of the standard.	Z	MP.6	Translate between geometric description and the equation for a conic section		A				A	x (geometry only)
65	G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.		Z	MP.1, MP.5	Use coordinates to prove simple geometric theorems algebraically		M				M	x (m3 only)
66	G-SRT.1a	Verify experimentally the properties of dilations given by a center and a scale factor: a) A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.		Z	MP.1, MP.3, MP.5, MP.8	Understand similarity in terms of similarity transformations		M			M		x (m2 only)
67	G-SRT.1b	Verify experimentally the properties of dilations given by a center and a scale factor: b) The dilation of a line segment is longer or shorter in the ratio given by the scale factor.		Z	MP.1, MP.3, MP.5, MP.8	Understand similarity in terms of similarity transformations		M			M		x (m2 only)

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68	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar.	i) The "explain" part of standard G-SRT.2 is not assessed here. See Sub-Claim C for this aspect of the standard.	Z	MP.7	Understand similarity in terms of similarity transformations		M			M		x (m2 only)
69	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	i) For example, find a missing angle or side in a triangle.	Z	MP.7	Prove theorems involving similarity.		M			M		x
70	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.		Z	MP.7	Define trigonometric ratios and solve problems involving right triangles		M			M		x (m2 only)
71	G-SRT.7-2	Use the relationship between the sine and cosine of complementary angles.	i) The "explain" part of standard G-SRT.7 is not assessed here; See Subclaim C for this aspect of the standard.	Z	MP.7	Define trigonometric ratios and solve problems involving right triangles		M			M		x (m2 only)
72	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.		X	MP.1, MP.2, MP.5, MP.6	Define trigonometric ratios and solve problems involving right triangles		M			M		x (m2 only)
86	S-IC.2	Decide if a specified model is consistent with results from a given data--generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*			MP.2, MP.4	Understand and evaluate random processes underlying statistical experiments.			S			S	
74	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.		Y	MP.1, MP.5, MP.7	Summarize, represent, and interpret data on two categorical and quantitative variables	S			A			x

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1	N-RN.B.Int.1	Apply properties of rational and irrational numbers to identify rational and irrational numbers.		N	MP.6	Use properties of rational and irrational numbers.	A				A		
2	A.Int.1	Solve equations that require seeing structure in expressions.	i) Tasks do not have a context. Ii) Equations simplify considerably after appropriate algebraic manipulations are performed. For example, if 24 + 10*x* - *x*^2 = *p* - (*x* - 5)^2 then find the value of *p;* solve (3*x* - 2)^2 = 6*x* - 4.	N	MP.7, MP.1		M		M	M	M	M	
3	A-SSE.2-4	Use the structure of a numerical expression or polynomial expression in one variable to rewrite it, in a case where two or more rewriting steps are required.	i) Example: Factorize completely: x^2 - 1 + (x-1)^2. (A first iteration might give (x+1)(x-1) + (x-1)^2, which could be rewritten as (x-1)(x+1+x-1) on the way to factorizing completely as 2x(x-1). Or the student might first expand, as x^2 - 1 + x^2 -2x + 1, rewriting as 2x^2 - 2x, then factorizing as 2x(x-1).) iii) Tasks do not have a context.	Z	MP.7, MP.1	Interpret the structure of expressions	M						
4	A-SSE.2-5	Use the structure of a quadratic or exponential expression to rewrite it, in a case where two or more rewriting steps are required.	i) Example: Factorize completely: x^2 - 1 + (x-1)^2. (A first iteration might give (x+1)(x-1) + (x-1)^2, which could be rewritten as (x-1)(x+1+x-1) on the way to factorizing completely as 2x(x-1). Or the student might first expand, as x^2 - 1 + x^2 -2x + 1, rewriting as 2x^2 - 2x, then factorizing as 2x(x-1).) iii) Tasks do not have a context.	Z	MP.7, MP.1	Interpret the structure of expressions					M		
5	A-SSE.2-6	Use the structure of a polyonmial, rational, or exponential expression to rewrite it, in a case where two or more rewriting steps are required.	i) An example from the 2009 College and Career Readiness Standards: Factorize completely: 6*cx* - 3*cy* - 2*dx* + *dy*. (A first iteration might give 3*c* (2*x* -*y*) + *d* (-2*x* +*y*), which could be recognized as 3*c* (2*x* -*y*) - *d* (2*x* -*y*) on the way to factorizing completely as (3*c* -*d*)(2*x* -*y*).) ii) Tasks do not have a context.	Z	MP.7, MP.1	Interpret the structure of expressions				M			
6	A-SSE.4-2	Use the formula for the sum of a finite geometric series to solve multi-step contextual problems.		Y	MP.1, MP.7	Write expressions in equivalent forms to solve problems				M			
7	A-CED.3-1	Solve multi-step contextual problems that require writing and analyzing systems of linear inequalities in two variables to find viable solutions.	i) Tasks have hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.). ii) Scaffolding in tasks may range from substantial to very little or none.	X	MP.1, MP.2, MP.4	Create equations that describe numbers or relationships	M			M			
8	A-REI.6-1	Solve multi-step contextual problems that require writing and analyzing systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	i) Tasks have hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.). ii) Scaffolding in tasks may range from substantial to very little or none.	X	MP.1, MP.2, MP.4	Solve systems of equations	A			A			

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9	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	i) See illustrations for F-IF.2 at http://illustrativemathematics.org.	X	MP.6, MP.7	Understand the concept of a function and use function notation	M			M			
10	F-IF.4-1	For a linear or quadratic function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums end behavior; and symmetries.*	i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/649, http://illustrativemathematics.org/illustrations/637, http://illustrativemathematics.org/illustrations/639	X	MP.6, MP.4	Interpret functions that arise in applications in terms of the context	M						
11	F-IF.4-2	For a rational, exponential, polynomial, trigonometric, or logarithmic function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums end behavior;symmetries ; and periodicity.*	i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/649, http://illustrativemathematics.org/illustrations/637, http://illustrativemathematics.org/illustrations/639	X	MP.6, MP.4	Interpret functions that arise in applications in terms of the context			M				
12	F-IF.4-3	For a linear function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums end behavior; and symmetries.*	i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/649, http://illustrativemathematics.org/illustrations/637, http://illustrativemathematics.org/illustrations/639	X	MP.6, MP.4	Interpret functions that arise in applications in terms of the context				M			
13	F-IF.4-4	For a quadratic or exponential function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums end behavior; and symmetries.*	i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/649, http://illustrativemathematics.org/illustrations/637, http://illustrativemathematics.org/illustrations/639	X	MP.6, MP.4	Interpret functions that arise in applications in terms of the context					M		
14	F-IF.4-5	For a rational, polynomial, trigonometric, or logarithmic function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; end behavior;symmetries ; and periodicity.*	i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/649, http://illustrativemathematics.org/illustrations/637, http://illustrativemathematics.org/illustrations/639	X	MP.6, MP.4	Interpret functions that arise in applications in terms of the context						M	

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45	F-IF.8a	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a) Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	i) Tasks have a context.		MP.2	Analyze functions using different representations.	S				S		
15	F-BF.3-4	Identify the effect on the graph of a quadratic function of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases using technology.	i) Illustrating an explanation is not assessed here (see SubClaim C)	X	MP.5, MP.3, MP.8	Build new functions from existing functions	A				A		
16	F-BF.3-5	Identify the effect on the graph of a polynomial, exponential, logarithmic, or trigonometric function of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	i) Illustrating an explanation is not assessed here (see SubClaim C)	X	MP.3, MP.5, MP.8	Build new functions from existing functions			A			A	
17	F-BF.Int.2	Find inverse functions to solve contextual problems. a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. *For example, f(x) = 2x^3 or f(x) = (x+1)/(x-1) for x ≠ 1.*	i) For example, see http://illustrativemathematics.org/illustrations/234 ii) As another example, given a function C(L) = 750L^2 for the cost C(L) of planting seeds in a square field of edge length L, write a function for the edge length L(C) of a square field that can be planted for a given amount of money C; graph the function, labeling the axes.	X	MP.1, MP.8, MP.6				A			A	
18	F-LE.2-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear and/or exponential function models, where exponentials are limited to integer exponents.	i) Prompts describe a scenario using everyday language. Mathematical language such as "function," "exponential," etc. is not used. ii) Students autonomously choose and apply appropriate mathematical techniques without prompting. For example, in a situation of doubling, they apply techniques of exponential functions. iii) For some illustrations, see tasks at http://illustrativemathematics.org under F-LE.	X	MP.1, MP.2, MP.6, MP.4	Construct and compare linear, quadratic , and exponential models and solve problems	S			M			

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19	F-LE.2-2	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear and/or exponential function models.	i) Prompts describe a scenario using everyday language. Mathematical language such as "function," "exponential," etc. is not used. i) Students autonomously choose and apply appropriate mathematical techniques without prompting. For example, in a situation of doubling, they apply techniques of exponential functions. iii) For some illustrations, see tasks at http://illustrativemathematics.org under F-LE.	X	MP.1, MP.2, MP.6, MP.4	Construct and compare linear, quadratic , and exponential models and solve problems			S	S		~~S~~	
20	F-Int.1-1	Given a verbal description of a linear or quadratic functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value. - E.g., a functional dependence might be described as follows: "The area of a square is a function of the length of its diagonal." The student would be asked to create an expression such as f(x) = (1/2) x^2 for this function. The natural domain for the function would be the positive real numbers. The function is increasing and nonlinear. And so on. - E.g., a functional dependence might be described as follows: "The slope of the line passing through the points (1, 3) and (7, y) is a function of y." The student would be asked to create an expression such as s(y) = (3-y)/(1-7) for this function. The natural domain for this function would be the real numbers. The function is increasing and linear. And so on.	Z	MP.1, MP.2, MP.8		x						
21	F-Int.1-2	Given a verbal description of a polynomial, exponential, rational, trigonometric, or logarithmic functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, periodic, nonlinear; and find an input value leading to a given output value.	Z	MP.1, MP.2, MP.8				x				
22	F-Int.1-3	Given a verbal description of a linear functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value. - E.g., a functional dependence might be described as follows: "The slope of the line passing through the points (1, 3) and (7, y) is a function of y." The student would be asked to create an expression such as s(y) = (3-y)/(1-7) for this function. The natural domain for this function would be the real numbers. The function is increasing and linear. And so on.	Z	MP.1, MP.2, MP.8					x			

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23	F-Int.1-4	Given a verbal description of a quadratic or exponential functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value. - E.g., a functional dependence might be described as follows: "The area of a square is a function of the length of its diagonal." The student would be asked to create an expression such as f(x) = (1/2) x^2 for this function. The natural domain for the function would be the positive real numbers. The function is increasing and nonlinear. And so on.	Z	MP.1, MP.2, MP.8						x		
24	F-Int.1-5	Given a verbal description of a rational, polynomial, trigonometric, or logarithmic functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, periodic, nonlinear; and find an input value leading to a given output value. - E.g., a functional dependence might be described as follows: "The area of a square is a function of the length of its diagonal." The student would be asked to create an expression such as f(x) = (1/2) x^2 for this function. The natural domain for the function would be the positive real numbers. The function is increasing and nonlinear. And so on. - E.g., a functional dependence might be described as follows: "The slope of the line passing through the points (1, 3) and (7, y) is a function of y." The student would be asked to create an expression such as s(y) = (3-y)/(1-7) for this function. The natural domain for this function would be the real numbers. The function is increasing and linear. And so on.	Z	MP.1, MP.2, MP.8							x	
25	G-C.A.Int.1	Identify and describe relationships among inscribed angles, radii, and chords and apply these concepts in problem solving situations.		Y	MP.1, MP.5	Understand and apply theorems about circles		A				A	
26	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.		Z	MP.5, MP.6, MP.7	Experiment with transformations in the plane		S		S			
27	G-CO.C	Prove geometric theorems as detailed in G-CO.C.	i) About 75% of tasks align to G.CO.9 or G.CO.10	Z	MP.3, MP.6	Prove geometric theorems		M		M			
28	G-CO.D	Make geometric constructions as detailed in G-CO.D.	i) About 75% of tasks align to G.CO.12.	Z	MP.3, MP.5, MP.6	Make geometric constructions		S			x	S	

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29	G-GPE.1-2	Understand or complete a derivation of the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.		N	MP.6	Translate between geometric description and the equation for a conic section		A				A	
30	G-Int.1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in G-MG and G-GPE.7	i) G-MG is the primary content ii) See examples at http://illustrativemathematics.org for G-MG.	X	MP.1, MP.2, MP.5, MP.6, MP.4			M				M	
31	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. ★	i) Tasks have multiple steps. ii) Tasks have a context.	Y	MP.1, MP.2, MP.5, MP.6, MP.4	Define trigonometric ratios and solve problems involving right triangles		M			M		
32	S-CP.Int.1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-CP.		Y	MP.1, MP.2, MP.5, MP.6, MP.4				A		A		
44	S-ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.		Y	MP.4, MP.2	Summarize, represent, and interpret data on a single count or measurement variable.			A			S	
33	S-IC.Int.1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-IC.		Y	MP.1, MP.2, MP.5, MP.6, MP.4				x			x	
34	S-ID.Int.1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and plotting residuals, and limiting function fitting to linear functions and exponential functions with domains in the integers.		Y	MP.1, MP.2, MP.5, MP.6, MP.4		x			x			
35	S-ID.Int.2	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and limiting function fitting to quadratic functions.		Y	MP.1, MP.2, MP.5, MP.6, MP.4		x				S		

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36	S-ID.Int.3	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and limiting function fitting to exponential functions.		Y	MP.1, MP.2, MP.5, MP.6, MP.4				x		S		
37	S-ID.6	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID.6, limiting function fitting to trigonometric functions.		Y	MP.1, MP.2, MP.5, MP.6				x			S	
38	HS.Int-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing quadratic function models and/or writing and solving quadratic equations.	i) A scenario might be described and illustrated with graphics (or even with animations in some cases). ii) Solutions may be given in the form of decimal approximations. iii) Some examples: - A company sells steel rods that are painted gold. The steel rods are cylindrical in shape and 6 cm long. Gold paint costs $0.15 per square inch. Find the maximum diameter of a steel rod if the cost of painting a single steel rod must be $0.20 or less. You may answer in units of centimeters or inches. Give an answer accurate to the nearest hundredth of a unit. - As an employee at the Gizmo Company, you must decide how much to charge for a gizmo. Assume that if the price of a single gizmo is set at P dollars, then the company will sell 1000 - 0.2P gizmos per year. Write an expression for the amount of money the company will take in each year if the price of a single gizmo is set at P dollars. What price should the company set in order to take in as much money as possible each year? How much money will the company make per year in this case? How many gizmos will the company sell per year? (Students might use graphical and/or algebraic methods to solve the problem.) - At t=0, a car driving on a straight road at a constant speed passes a telephone pole. From then on, the car's distance from the telephone pole is given by C(t) = 30t, where t is in seconds and C is in meters. Also at t=0, a motorcycle pulls out onto the road, driving in the same direction, initially 90 m ahead of the car. From then on, the motorcycle's distance from the telephone pole is given by M(t) = 90 + 2.5 t^2, where t is in seconds and M is in meters. At what time t does the car catch up to the motorcycle? Find the answer by setting C and M equal. How far are the car and the motorcycle from the telephone pole when this happens? (Students might use graphical and/or algebraic methods to solve the problem.)	Y	MP.1, MP.2, MP.5, MP.6, MP.4		x				x		
39	HS-Int.2	Solve multi-step mathematical problems with degree of difficulty appropriate to the course that require analyzing quadratic functions and/or writing and solving quadratic equations.	i) Tasks do not have a context. ii) Exact answers may be required or decimal approximations may be given. Students might choose to take advantage of the graphing utility to find approximate answers or clarify the situation at hand. Some examples: - Given the function $f(x) = x^2 + x$, find all values of k such that $f(3 - k) = f(3)$. (Exact answers are required.) - Find a value of c so that the equation $2x^2 - cx + 1 = 0$ has a double root. Give an answer accurate to the tenths place.	Y	MP.1, MP.5, MP.6		x				x		
40	HS-Int.3-1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.	i) F-LE is the primary content and at least one of the other listed content elements will be involved in tasks as well.		MP.4, MP.2		S			S			x
41	HS-Int.3-2	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear and quadratic functions.	i) F-LE is the primary content and at least one of the other listed content elements will be involved in tasks as well.		MP.4, MP.2		S			M			x
42	HS-Int.3-3	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7	i) F-LE is the primary content and at least one of the other listed content elements will be involved in tasks as well.		MP.4, MP.2				S			S	

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43	F-Int.3	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-TF.B, F-IF.B, F-IF.7, limited to trigonometric functions.	i) F-TF.B is the primary content and at least one of the other listed content elements will be involved in tasks as well.		MP.4, MP.2				A			A	x
44	S-IC.3-1	Recognize the purposes of and differences among sample surveys, experiments, and observational studies.	i) The "explain" part of standard S-IC.3 is not assessed here; See Subclaim D for this aspect of the standard.	Z		Make inferences and justify conclusions from sample surveys, experiments, and observational studies			M			M	x

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2	HS.C.2.1	Base explanations/reasoning on the properties of rational and irrational numbers. Content scope: N-RN.3		Y	MP.3	Use properties of rational and irrational numbers	A				A	
3	HS.C.3.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about numbers or number systems. Content scope: N-RN, N-CN		Y	MP.3				x		x	
56	HS.C.3.2	Base explanations/reasoning on the properties of exponents. Content scope: N-RN.A		Y	MP.3, MP.8	Extend the properties of exponents to rational exponents			M		M	
4	HS.C.4.1	Derive a formula Content scope: A-SSE.4		Y	MP.6	Write expressions in equivalent forms to solve problems			M			M
7	HS.C.5.4	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: A-REI.2	See for example the illustration that begins "A student performs the following steps in solving an equation...", in ITN Appendix F (revised), Section A. "Illustrations of innovative task characteristics," subsection 6 "Expressing Mathematical Reasoning," subsection "Illustrative tasks that require students to express mathematical reasoning."	Y	MP.3	Understand solving equations as a process of reasoning and explain the reasoning			M			M
8	HS.C.5.5	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: A-REI.4a, A-REI.4b, limited to real solutions only.		Y	MP.3	Solve equations and inequalities in one variable	M				M	
9	HS.C.5.6	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: A-REI.5		Y	MP.3	Solve systems of equations	A			A		
12	HS.C.5.10	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: A-REI.11, limited to equations of the form f(x) = g(x) where f and g are polynomials.	i) For example, students might be asked how many positive solutions there are to the equation $7(1-x) = 1/x^2$ or the equation $7(1-x) = 2/x^2$, explaining how they know. The student might use technology strategically to plot both sides of the equation without prompting.	Y	MP.3	Represent and solve equations and inequalities graphically	M			M		
13	HS.C.5.11	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: A-REI.11, involving any of the function types measured in the standards.	i) For example, students might be asked how many positive solutions there are to the equation $e^x = x+2$ or the equation $e^x = x+1$, explaining how they know. The student might use technology strategically to plot both sides of the equation without prompting.	Y	MP.3	Represent and solve equations and inequalities graphically			M			M

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14	HS.C.6.1	Base explanations/reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content scope: A-REI.D, excluding exponential and logarithmic functions.		Y	MP.3	Represent and solve equations and inequalities graphically	M			M		
15	HS.C.6.2	Base explanations/reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content scope: A-REI.D		Y	MP.3	Represent and solve equations and inequalities graphically			M			M
17	HS.C.6.4	Base explanations/reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content scope: G-GPE.2		Y	MP.3	Translate between the geometric description and the equation for a conic section			A			A
18	HS.C.7.1	Base explanations/reasoning on the relationship between zeros and factors of polynomials. Content scope: A-APR.B		Y	MP.3	Understand the relationship between zeros and factors of polynomials			M			M
19	HS.C.8.1	Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures. Content scope: A-APR.1		Y	MP.3	Perform arithmetic operations on polynomials	M				M	
20	HS.C.8.2	Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures. Content scope: A-APR.4		Y	MP.3	Use polynomial identities to solve problems			A			A
21	HS.C.8.3	Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures. Content scope: A-APR		Y	MP.3				X			X
22	HS.C.9.1	Express reasoning about transformations of functions. Content scope: F-BF.3, limited to linear and quadratic functions. Tasks will not involve ideas of even or odd functions		Y	MP.3	Build new functions from existing functions	A				A	
23	HS.C.9.2	Express reasoning about transformations of functions. Content scope: F-BF.3, which may involve polynomial, exponential, logarithmic or trigonometric functions. Tasks also may involve even and odd functions.		Y	MP.3	Build new functions from existing functions			A			S
24	HS.C.10.1	Express reasoning about linear and exponential growth. Content scope: F-LE.1a		Y	MP.3	Construct and compare linear, quadratic, and exponential models and solve problems	S			S		
25	HS.C.11.1	Express reasoning about trigonometric functions and the unit circle. Content scope: F-TF.2, F-TF.8	For example, students might explain why the angles $151\pi/3$ and $\pi/3$ have the same cosine value, use the unit circle to prove that $\sin^2(3\pi/4) + \cos^2(3\pi/4) = 1$, or compute the tangent of the angle in the first quadrant having sine equal to 1/3.	Y	MP.3				A			A

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26	HS.C.12.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions. Content scope: F-IF.8a.	i) Tasks involve using algebra to prove properties of given functions. For example, prove algebraically that the function h(t) = t(t-1) has minimum value 1/4; prove algebraically that the graph of g(x) = x^2 - x + 1/4 is symmetric about the line x = 1/2; prove that x^2 + 1 is never less than -2x. ii) Scaffolding is provided to ensure tasks have appropriate level of difficulty. (For example, the prompt could show the graphs of x^2 + 1 and -2x on the same set of axes, and say, "From the graph, it looks as if x^2 + 1 is never less than -2x. In this task, you will use algebra to prove it." And so on, perhaps with additional hints or scaffolding.	Y	MP.3	Analyze funcitons using different representations	S				S	
27	HS.C.12.2	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions. Content scope: F-IF.8b.	i) Tasks involve using algebra to prove properties of given functions. For example, prove algebraically that the function f(n) = 3^n satisfies f(n+1) = 3f(n); prove that the function defined by f(0) = 1, f(n+1) = 5f(n) is not linear. ii) Scaffolding is provided to ensure tasks have appropriate level of difficulty	Y	MP.3	Analyze funcitons using different representations			S		S	
28	HS.C.13.1	Apply geometric reasoning in a coordinate setting, and/or use coordinates to draw geometric conclusions. Content scope: G-GPE.6, G-GPE.7		Y	MP.3	Use coordinates to prove simple geometric theorems algebraically		M				M
29	HS.C.13.2	Apply geometric reasoning in a coordinate setting, and/or use coordinates to draw geometric conclusions. Content scope: G-GPE.4		Y	MP.3	Use coordinates to prove simple geometric theorems algebraically		M				M
30	HS.C.13.3	Apply geometric reasoning in a coordinate setting, and/or use coordinates to draw geometric conclusions. Content scope: G-GPE.5		Y	MP.3	Use coordinates to prove simple geometric theorems algebraically		M				M
32	HS.C.14.1	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content scope: G-CO.9, G-CO.10		Y	MP.3	Prove geometric theorems		M		M		
33	HS.C.14.2	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content scope: G-CO.A, G-CO.B		Y	MP.3			x		x		
34	HS.C.14.3	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content scope: G-CO.D		Y	MP.3	Make geometric constructions		S				S
36	HS.C.14.5	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content scope: G-SRT.A		Y	MP.3	Understand similarity in terms of similarity transformations		M			M	
37	HS.C.14.6	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content scope: G-SRT.B		Y	MP.3	Prove theorems involving similarity		M			M	
51	HS.C.15.14	Present solutions to multi-step problems in the form of valid chains of reasoning, using symbols such as equals signs appropriately (for example, rubrics award less than full credit for the presence of nonsense statements such as 1 + 4 = 5 + 7 = 12, even if the final answer is correct), or identify or describe errors in solutions to multi-step problems and present corrected solutions. Content scope: G-SRT.C		Y	MP.6	Define trigonometric ratios and solve problems involving right triangles		M			M	
54	HS.C.16.2	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Tasks are limited to quadratic equations. Content scope: A-REI.1, A-REI.4a, A-REI.4b, limited to real solutions only.		Y	MP.6		M				M	

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55	HS.C.16.3	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Tasks are limited to simple rational or radical equations. Content scope: A-REI.1.		Y	MP.6				S			M
58	HS.C.17.2	Make inferences and justify conclusions from data. Content scope: S-IC.B		Y	MP.2, MP.4	Make inferences and justify conclusions from sample surveys, experiments, and observational studies			S			S
59	HS.C.17.3	Make inferences and justify conclusions from data. Content scope: S-IC.3		Y	MP.2, MP.5	Make inferences and justify conclusions from sample surveys, experiments, and observational studies			M			M
60	HS.C.17.4	Make inferences and justify conclusions from data. Content scope: S-IC.5		Y	MP.2, MP.6	Make inferences and justify conclusions from sample surveys, experiments, and observational studies			M			M
61	HS.C.17.5	Make inferences and justify conclusions from data. Content scope: S-IC.6		Y	MP.2, MP.7	Make inferences and justify conclusions from sample surveys, experiments, and observational studies			M			M

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1	HS.D.1-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course, requiring application of knowledge and skills articulated in 7.RP.A, 7.NS.3, 7.EE, and/or 8.EE.		Y	MP 4, may involve MP 1, 2, 5, 7	x			x			
2	HS.D.1-2	Solve multi-step contextual problems with degree of difficulty appropriate to the course, requiring application of knowledge and skills articulated in6.G, 7.G, and/or 8.G.		Y	MP 4, may involve MP 1, 2, 5, 7		x			x		
3	HS.D.2-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course involving perimeter, area, or volume that require solving a quadratic equation.	i) To make the tasks involve strategic use of tools - in this case, the quadratic formula (see e.g., MCF, p. 81, final paragraph on the sense in which the quadratic formula is a tool) - tasks do not cue students that a quadratic equation is involved in the task, do not cue use of the quadratic formula, etc. ii) For example, - An artist wants to build a right-triangular frame in which one of the legs exceeds the other in length by 1 unit, and in which the hypotenuse exceeds the longer leg in length by 1 unit. Use algebra to show that there is one and only one such right triangle, and determine its side lengths. - The SBAC "cake problem" in their item specs http://tinyurl.com/sbacsampleitemshs	Y	MP.1,MP.4, MP.5		x			x		
4	HS.D.2-2	Solve multi-step contextual problems with degree of difficulty appropriate to the course involving perimeter, area, or volume that require finding an approximate solution to a polynomial equation using numerical/graphical means.	i) Tasks may or may not have a context. ii) Tasks may involve coordinates (G-GPE.7) ii) Refer to A-REI.11 for some of the content knowledge from the previous course relevant to these tasks. iii) To make the tasks involve strategic use of tools (MP.5), calculation and graphing aids are available but tasks do not prompt the student to use them. iv) See for example the "Propane Tanks" task in ITN Appendix F.	Y	MP.1,MP.4, MP.5		x			x		
5	HS.D.2-3	Solve multi-step contextual problems with degree of difficulty appropriate to the course that require solving a system of three linear equations in three unknowns.		Y				x		x		
6	HS.D.2-4	Solve multi-step contextual problems with degree of difficulty appropriate to the course that require writing an expression for an inverse function.	i) Refer to F-BF.4a for some of the content knowledge relevant to these tasks.	Y				x			x	

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7	HS.D.2-5	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-2, limited to linear equations and exponential equations with integer exponents.	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2	M			M			
8	HS.D.2-6	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q.~~2~~1, A-SSE.3, A-REI.6, ~~A-REI.7~~, A-REI.12, A-REI.11-2, limited to linear and quadratic equations	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2	M				M		
9	HS.D.2-7	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q.~~2~~1, A-SSE.3, A-REI.6, A-REI.7, A-REI.12, A-REI.11-2	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2			S			M	
10	HS.D.2-8	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a~~A~~, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.	i) F-BF.1a~~A~~ is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2	S			M			
11	HS.D.2-9	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a~~A~~, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear and quadratic functions.	i) F-BF.1a~~A~~ is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2	S				S		
12	HS.D.2-10	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.A, F-BF.3, F-IF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7	i) F-BF.A is the primary content; other listed content elements may be involved in tasks as well.	Y	MP.4, MP.2			M			A	

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13	HS.D.2-11	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in G-SRT.8, involving right triangles in an applied setting.	i) Tasks may or may not require the student to autonomously make an assumption or simplification in order to apply techniques of right triangles. For example, a configuration of three buildings might form a triangle that is nearly but not quite a right triangle, so that a good approximate result can be obtained if the student autonomously approximates the triangle as a right triangle.	Y	MP.4, MP.2		M			M		x
14	HS.D.2-12	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, S-IC, and S-CP.	i) Longer tasks may require some or all of the steps of the modeling cycle (CCSSM, pp. 72, 73); for example, see ITN Appendix F, "Karnataka" task (Section A "Illustrations of innovative task characteristics," subsection 7 "Modeling/Application," subsection f "Full Models"). As in the Karnataka example, algebra and function skills may be used.	Y	MP.1, MP.2, MP.4, MP.5, MP.6			x			x	
15	HS.D.2-13	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID and S-IC, including normal distributions.	i) Longer tasks may require some or all of the steps of the modeling cycle (CCSSM, pp. 72, 73); for example, see ITN Appendix F, "Karnataka" task (Section A "Illustrations of innovative task characteristics," subsection 7 "Modeling/Application," subsection f "Full Models"). As in the Karnataka example, algebra and function skills may be used.	Y	MP.1, MP.2, MP.4, MP.5, MP.6			x			x	
16	HS.D.3-1	Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature). Content Scope: Knowledge and skills articulated in grades 6-8, excepting the Geometry domain.		Y	MP 4, may involve MP 1, 2, 5, 7	x			x			
17	HS.D.3-2	Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature). Content Scope: Knowledge and skills articulated in grades 6-8, including 6.G, 7.G, and 8.G.	i) Tasks include a geometric aspect. ii) Tasks may also include other content dimensions (e.g., algebraic, numerical).	Y	MP 4, may involve MP 1, 2, 5, 7		x			x		
18	HS.D.3-3	Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity. Content Scope: Knowledge and skills articulated in grades 6-8, excepting the Geometry domain.		Y	MP 4, may involve MP 1, 2, 5, 7	x			x			

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19	HS.D.3-4	Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity. Content Scope: Knowledge and skills articulated ingrades 6-8, including 6.G, 7.G, and 8.G.	i) Tasks include a geometric aspect. ii) Tasks may also include other content dimensions (e.g., algebraic, numerical).	Y	MP 4, may involve MP 1, 2, 5, 7		x			x		
20	HS.D.3-5	Decisions from data: Identify relevant data in a data source, analyze it, and draw reasonable conclusions from it. Content scope: 6.SP, 7.SP.A, 7.SP.B, 8.SP	i) Tasks may result in an evaluation or recommendation. ii) The purpose of tasks is not to provide a setting for the student to demonstrate breadth in data analysis skills (such as box-and-whisker plots and the like). Rather, the purpose is for the student to draw conclusions in a realistic setting using elementary techniques.	Y	MP 4, may involve MP 1, 2, 5, 7			x			x	
21	HS.D.3-6	Full models: Identify variables in a situation, select those that represent essential features, formulate a mathematical representation of the situation using those variables, analyze the representation and perform operations to obtain a result, interpret the result in terms of the original situation, validate the result by comparing it to the situation, and either improve the model or briefly report the conclusions. Content scope: Knowledge and skills articulated in the Standards in grades 6 through 8.	i) See CCSSM, pp. 72, 73 for more information. ii) Task prompts describe a scenario using everyday language. Mathematical language such as "function," "equation," etc. is not used. iii) Tasks require the student to make simplifying assumptions autonomously in order to formulate a mathematical model. For example, the student might autonomously make a simplifying assumption that every tree in a forest has the same trunk diameter, or that water temperature is a linear function of ocean depth. iv) Tasks may require the student to create a quantity of interest in the situation being described. (Cf. (N-Q.2).) For example, in a situation involving population and land area, the student might autonomously decide that population density is a key variable, and then choose to work with persons per square mile. In a situation involving data, the student might autonomously decide that a measure of center is a key variable in a situation, and then choose to work with the mean. v) Tasks may involve choosing a level of accuracy appropriate to limitations of measurement or limitations of data when reporting quantities (N-Q.3, first introduced in AI/M1).	Y	MP 4, may involve MP 1, 2, 5, 7			x			x	

Consistent with the Grades 3-8 blueprints, in which approximately 12 points of the Grade N test come from Grade N-1 evidence statements, approximately 10 points of the A1 and M1 tests come from the Grade 8 evidence statements below (see Summary worksheet). Evidence statement keys refer to the grade 8 blueprint.	Algebra I	Geometry	Algebra II	Math 1	Math 2	Math 3	EOY only?	Calculator
8.EE.1	x			x			x	N
8.EE.2	x			x			x	N
8.EE.3	x			x			x	N
8.EE.4-1	x			x			x	N
8.EE.5-1	x			x				Y
8.EE.5-2	x			x				Y
8.EE.7b	x			x				N
8.EE.8a	x			x				N
8.EE.8b-1	x			x				N
8.EE.8b-2	x			x				N
8.EE.8b-3	x			x				N
8.EE.8c	x			x				N
8.F.1-1	x			x				N
8.F.1-2	x			x				N
8.F.2	x			x			x	Y
8.F.3-1	x			x				N
8.F.4	x			x				Y
8.F.5-1	x			x				N
8.F.5-2	x			x				N

Algebra I Updated 10/19/12	*This table is meant to summarize the overall construction of the assessment. Please see the course-level evidence statement emphases document for more details regarding the evidences statements for each component*													
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn from evidence statements listed in:**	**Scoring**									
PBA(1a)	2	1	2	Grade8-Type I.1	Machine Scoring									
PBA(1b)	8	1	8	HS-Type I.1	Machine Scoring	0-3								
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring									
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3								
PBA(3a)	6	6	1	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
PBA(3b)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring	0-6								
PBA(3c)	6	6	1	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
EOY(1a)	2	1	2	Grade8-Type I.1	Machine Scoring									
EOY(1b)	4	1	4	Grade8-Type I.1	Machine Scoring									
EOY(1c)	2	1	2	Grade8-Type I.1	Machine Scoring									
EOY(2a)	16	1	14	HS-Type I.1 Major Content	Machine Scoring									
EOY(2b)	3	1	3	HS-Type I.1 Supporting/Additional Content	Machine Scoring	3								
EOY(3a)	26	9x2+2x4	11	HS-Type I.(x>1)	Machine Scoring									
EOY(3b)	12	4x2+1x4	5	HS-Type I.(x>1) Supporting/Additional Content	Machine Scoring	12								
	107	1.81	59			18-27 points additional/supporting								
Math 1Updated 10/19/12														
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn from evidence statements listed in:**	**Scoring**									
PBA(1a)	2	1	2	Grade8-Type I.1	Machine Scoring									
PBA(1b)	8	1	8	HS-Type I.1	Machine Scoring	**0-1**								
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring									
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3								
PBA(3a)	6	6	1	HS-Subclaim D	Machine Scoring and/or Hand Scoring									
PBA(3b)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
PBA(3c)	6	6	1	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
EOY(1a)	2	1	8	Grade8-Type I.1	Machine Scoring									
EOY(1b)	4	1	4	Grade8-Type I.1	Machine Scoring									
EOY(1c)	2	1	2	Grade8-Type I.1	Machine Scoring									
EOY(2a)	12	1	10	HS-Type I.1 Major Content	Machine Scoring									
EOY(2b)	5	1	5	HS-Type I.1 Supporting/Additional Content	Machine Scoring	5								
EOY(3)	40	14x2+3x4	17	HS-Type I.(x>1)	Machine Scoring	12								
	107	1.67	64			20-21 points additional/supporting								
Geometry updated 10/12/12														
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn from evidence statements listed in:**	**Scoring**									
PBA(1)	10	1	10	HS-Type I.1	Machine Scoring									
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring									
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3								
PBA(3a)	6	6	1	HS-Subclaim D	Machine Scoring and/or Hand Scoring									
PBA(3b)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
PBA(3c)	6	6	1	HS-SubclaimD	Machine Scoring and/or Hand Scoring									
EOY(1)	25	1	25	HS-Type I.1	Machine Scoring	10								
EOY(2a)	32	12x2+2x4	14	HS-Type I.(x>1)	Machine Scoring	16								
EOY(2b)	8	2x2+1x4	3	HS-Type I.(x>1)	Machine Scoring									
	107	1.78	60			29 points additional/supporting								
Math 2updated 10/12/12														
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn equiprobably from among evidence statements listed in:**	**Scoring**									
PBA(1)	10	1	10	HS-Type I.1	Machine Scoring	1								
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring									
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3								

PBA(3a)	6	6	1	HS-Subclaim D	Machine Scoring and/or Hand Scoring								
PBA(3b)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring	0-3							
PBA(3c)	6	6	1	HS-SubclaimD	Machine Scoring and/or Hand Scoring								
EOY(1a)	17	1	17	HS-Type I.1 Major Content	Machine Scoring								
EOY(1b)	6	1	6	HS-Type I.1 Supporting/Additional Content	Machine Scoring	6							
EOY(2a)	28	8x2 + 3x4	11	HS-Type I.(x>1) Major Content	Machine Scoring								
EOY(2b)	14	5x2 + 1x4	6	HS-Type I.(x>1) Supporting/Additional Content	Machine Scoring	14							
	107	1.84	58			24-27 points additional/supporting							
Algebra II + CCR													
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn equiprobably from among evidence statements listed in:**	**Scoring**								
PBA(1)	10	1	10	HS-Type I.1 (CCR content from Alg I and Geom)	Machine Scoring								
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content (Alg II)	Machine Scoring and/or Hand Scoring								
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content (Alg II)	Machine Scoring and/or Hand Scoring	3							
PBA(3a)	2	2	1	HS-Subclaim D-CourseLevel	Machine Scoring and/or Hand Scoring								
PBA(3b)	2	2	1	HS-SubclaimD-Course Level	Machine Scoring and/or Hand Scoring	0-2							
PBA(4)	6	6	1	HS-SubclaimD-SecurelyHeld	Machine Scoring and/or Hand Scoring								
PBA(5)	6	6	1	HS-SubclaimD-CourseLevel (CCR content from Alg I and Geom)	Machine Scoring and/or Hand Scoring								
EOY(1)	20	4	5	HS-Subclaim D-CourseLevel (CCR content from Alg I and Geom)	Machine Scoring								
EOY(2a)	10	1	10	HS-Type I.1 Major Content (Alg II)	Machine Scoring								
EOY(2b)	5	1	5	HS-Type I.1 Supporting/Additional Content (Alg II)	Machine Scoring	5							
EOY(3)	12	1	12	HS-Type I.1 (CCR content from Alg I and Geom)	Machine Scoring								
EOY(4)	4	2	2	HS-Type I.(x>1) (CCR content from Alg I and Geom)	Machine Scoring								
EOY(5a)	10	2	5	HS-Type I.(x>1) Major Content (Alg II)	Machine Scoring								
EOY(5b)	6	2	3	HS-Type I.(x>1) Supporting/Additional (Alg II)	Machine Scoring	6							
	107	1.78	60			14-16 points additional/supporting Alg II (~30% of Alg II)							
						49 points total Alg II							
						6 points built on skills first introduced in 6-8							
						52 points 6-8, Alg I, Geom							
Math 3 + CCR													
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn equiprobably from among evidence statements listed in:**	**Scoring**								
PBA(1)	10	1	10	HS-Type I.1 (CCR content from Math 1 and Math 2)	Machine Scoring								
PBA(2)	11	3+4+4	3	HS-Subclaim C Major Content (Math 3)	Machine Scoring and/or Hand Scoring								
PBA(2)	3	3	1	HS-Subclaim C Supporting/Additional Content (Math 3)	Machine Scoring and/or Hand Scoring	3							
PBA(3a)	2	2	1	HS-Subclaim D-CourseLevel	Machine Scoring and/or Hand Scoring								
PBA(3b)	2	2	1	HS-SubclaimD-Course Level	Machine Scoring and/or Hand Scoring	0-2							
PBA(4)	6	6	1	HS-SubclaimD-SecurelyHeld	Machine Scoring and/or Hand Scoring								
PBA(5)	6	6	1	HS-SubclaimD-CourseLevel (CCR content from Math 1 and Math 2)	Machine Scoring and/or Hand Scoring								
EOY(1)	20	4	5	HS-Subclaim D-CourseLevel (CCR content from Math 1 and Math 2)	Machine Scoring								
EOY(2a)	9	1	9	HS-Type I.1 Major Content (Math 3)	Machine Scoring								
EOY(2b)	6	1	6	HS-Type I.1 Supporting/Additional Content (Math 3)	Machine Scoring	6							
EOY(3)	12	1	12	HS-Type I.1 (CCR content from Math 1 and Math 2)	Machine Scoring								
EOY(4)	4	2	2	HS-Type I.(x>1) (CCR content from Math 1 and Math 2)	Machine Scoring								
EOY(5a)	10	2	5	HS-Type I.(x>1) Major Content (Math 3)	Machine Scoring								
EOY(5b)	6	2	3	HS-Type I.(x>1) Supporting/Additional (Math 3)	Machine Scoring	6							
	107	1.78	60			15-17 points additional/supporting Alg II (~30% of Math 3)							
						49 points total Math 3							
						6 points built on skills first introduced in 6-8							
						52 points 6-8, Math 1, Math 2							
Algebra II updated 10/12/12													
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn equiprobably from among evidence statements listed in:**	**Scoring**								
PBA(1a)	7	1	7	HS-Type I.1 Major Content	Machine Scoring								

PBA(1b)	3	1	3	HS-Type I.1 Supporting/Additional Content	Machine Scoring	3							
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring								
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3							
PBA(3a)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring	0-3							
PBA(3b)	12	6+6	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring								
EOY(1a)	15	1	15	HS-Type I.1 Major Content	Machine Scoring								
EOY(1b)	8	1	8	HS-Type I.1 Supporting/Additional Content	Machine Scoring	8							
EOY(2a)	28	10x2 + 2x4	12	HS-Type I.(x>1) Major Content	Machine Scoring								
EOY(2b)	14	5x2 + 1x4	6	HS-Type I.(x>1) Supporting/Additional Content	Machine Scoring	14							
	107	1.81	59			28-31 points additional/supporting							
Math 3 updated 10/12/12													
Component	**No. Points**	**Points per task**	**No. Tasks**	**Drawn equiprobably from among evidence statements listed in:**	**Scoring**								
PBA(1)	10	1	10	HS-Type I.1	Machine Scoring	1							
PBA(2a)	11	3+4+4	3	HS-Subclaim C Major Content	Machine Scoring and/or Hand Scoring								
PBA(2b)	3	3	1	HS-Subclaim C Supporting/Additional Content	Machine Scoring and/or Hand Scoring	3							
PBA(3a)	6	3+3	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring	0-3							
PBA(3b)	12	6+6	2	HS-SubclaimD	Machine Scoring and/or Hand Scoring								
EOY(1a)	15	1	15	HS-Type I.1 Major Content	Machine Scoring								
EOY(1b)	8	1	8	HS-Type I.1 Supporting/Additional Content	Machine Scoring	8							
EOY(2a)	28	14x2	14	HS-Type I.(x>1) Major Content	Machine Scoring								
EOY(2b)	14	3x2 + 2x4	5	HS-Type I.(x>1) Supporting/Additional Content	Machine Scoring	14							
	107	1.78	60			26-29 points additional/supporting content							